REMARKS

In a non-final Office Action mailed May 4, 2004, the Examiner rejected the pending claims (1-13, 15-19, and 21-25) under 35 U.S.C. §103(a) as being unpatentable over Stanforth '133 in view of Pisani '773. The pending claims were also rejected under 35 U.S.C. §103(a) over Stanforth '133 in view of Ruby et al. No claim is allowed.

Both rejections rely principally upon Stanforth '133. Citing Stanforth, the Examiner notes that "[t]reatment using a combination of phosphate and chloride under acid conditions, a pH of less than 5, results in a reduced solubility for lead. However, unacceptable amounts of lead can still be available. In order to enhance the P/Cl treatment, the introduction of a ferrous ion into the soil will further reduce the availability of lead. Table 2 teaches the treatment of soil with the ferrous ion in addition to the chloride and phosphate ions under acidic conditions." (emphasis added)

As applicants have noted, Stanforth traps lead from soil or waste in the solid product formed while oxidizing ferrous ion to form a solid ferric iron oxidation product that incorporates the lead to reduce lead solubility. Without this oxidation step, Stanforth's process is very inefficient at reducing bioavailability. For example, Table 4 of Stanforth shows significant residual PBET lead when the oxidation step is omitted. Stanforth discloses at col. 8, lines 30-38 that, of the materials tested, only iron in ferrous form was effective to reduce lead bioavailability, and then only in connection with the oxidation step. Stanforth further teaches away from the present invention, saying "[o]ther inorganic additives – including ferric iron, ferrous iron without oxidation, manganese, aluminum and silicates – were not effective in reducing lead solubility" (and hence bioavailability). Applicants note that Stanforth refers to "coating treatments" in this paragraph, pointing out again that the goal of Stanforth's method is to trap lead in a coating, rather than to form a chemical species having reduced bioavailability.

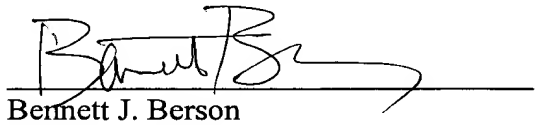
In contrast to Stanforth, the applicants use ferric iron. The claims are amended to reflect this use of ferric iron in applicants' methods. Use by the applicants of ferric iron, which requires no oxidation step, is not mere substitution of an end product for the reactants of Stanforth. Applicants have previously noted that formation of an oxidation product is essential to Stanforth's method but is not a part of applicants' methods. Instead, applicants' methods rely upon formation of metal chloropyromorphite as claimed.

For these reasons, the applicants' methods for reducing bioaccessibility of a heavy metal cannot be rendered obvious by Stanforth, even in view of Pisani or in view of Ruby et al. Applicants have previously commented on distinctions between the curing step of Pisani and the recited incubation step and incorporate those comments herein. Moreover, Pisani's method related to minimizing waste permeability rather than to reducing bioaccessibility of heavy metals. Pisani examined only leachability and was unconcerned about bioavailability. As applicants noted in paragraph 0005 of the specification, behavior of a heavy metal in a regulatory leaching test such as TCLT, SPLP, or ASTM water leach test, or aqueous solubility of lead from metal-contaminated particulate matter, is not indicative of its bioavailability. On the other hand, Ruby et al. is concerned with bioaccessibility, but does not, when combined with Stanforth, yield the claimed methods. In the highlighted bridging pages 3701 and 3702, Ruby et al. do not show incubation conditions of soils treated with the additives recited in the claims. In particular, Stanforth provides no motivation to employ ferric iron and Ruby provides no motivation to include a chloride additive.

Since the Examiner will acknowledge that treatment with distinct chemistry yields distinct results, it is not appropriate to combine disparate results from distinct trials to assert obviousness, particularly in view of Stanforth's consistent use of ferrous iron. Because the range of outcomes can vary greatly with changes to the inputs, the suitability of the claimed method cannot be predicted and is not obvious, from the cited documents.

For all of these reasons, applicants respectfully request reconsideration of the merits of this patent application and withdrawal of the rejections under 35 U.S.C. §103(a).

Respectfully submitted,



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